

CLAIMS

1. A substrate of a target substance
detection element to be used for a detection
5 apparatus for detecting a target substance, utilizing
surface plasmon resonance, comprising:

a base; and

a metal structure arranged on a surface of the
base in a localized manner, said metal structure
10 having at least either of a loop section and a
crossing section.

2. The substrate according to claim 1,
wherein said metal structure has a largest length
between two edges that is found within a range not
15 smaller than 10 nm and not greater than 1,450 nm.

3. The substrate according to claim 2,
wherein the largest length between two edges is found
within a range not smaller than 50 nm and not greater
than 450 nm.

20 4. The substrate according to claim 1,
wherein it comprises a plurality of metal structures
that are spaced apart from each other.

5. The substrate according to claim 4,
wherein any two adjacently located metal structures
25 are separated by a distance that is found within a
range not smaller than 50 nm and not greater than
2,000 nm.

6. The substrate according to claim 5,
wherein the distance separating any two adjacently
located metal structures is found within a range not
smaller than 150 nm and not greater than 1,000 nm.

5 7. The substrate according to claim 1,
wherein said metal structure is made of a metal
selected from gold, silver, copper and aluminum or an
alloy of any of them.

8. The substrate according to claim 1,
10 wherein said base is optically transparent.

9. A substrate of a target substance
detection element to be used for a detection
apparatus for detecting a target substance, utilizing
surface plasmon resonance, comprising:

15 a base; and

a metal film having an aperture and arranged on
a surface of the base, said aperture having at least
either of a loop section and a crossing section.

10. The substrate according to claim 9,
20 wherein it comprises a plurality of apertures that
are spaced apart from each other.

11. The substrate according to claim 10,
wherein any two adjacently located apertures are
separated by a distance that is found within a range
25 not smaller than 50 nm and not greater than 2,000 nm.

12. The substrate according to claim 11,
wherein the distance separating any two adjacently

located apertures is found within a range not smaller than 150 nm and not greater than 1,000 nm.

13. The substrate according to claim 1,
wherein said metal structure comprises an outer frame
5 structure having an aperture and an inner structure
arranged in said aperture and spatially separated
from the outer frame structure.

14. A target substance detection element
comprising:

10 a substrate according to any one of claims 1
through 13; and

a target substance capturing body arranged on
said metal structure.

15 15. An apparatus for detecting a target
substance in a specimen by utilizing surface plasmon
resonance, comprising:

holding means for holding a target substance
detection element according to claim 14;

20 means for bringing the element into contact
with the specimen; and

detecting means for detecting the target
substance captured by the element.

16. The apparatus according to claim 15,
wherein said detecting means is an optical detecting
25 means.

17. A method of detecting a target substance
in a specimen by utilizing surface plasmon resonance,

comprising:

a step of bringing a target substance detection element according to claim 14 into contact with the specimen; and

5 a step of detecting the target substance captured by the element when the specimen contains the target substance.

18. A kit for detecting the presence or absence of a target substance in a specimen or the
10 quantity of the target substance, comprising:

a target substance detection element according to claim 14; and

an agent required to capture the target substance by means of said element.

15 19. The target substance detection element according to claim 14, wherein said target substance capturing body is an antibody.

20 20. The target substance detection element according to claim 19, wherein said antibody is an antibody fragment.

21. The target substance detection element according to claim 20, wherein said antibody fragment is a multi-specific multivalent antibody.